



ROUNDDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

VOL. 14 No. 25

Friday, December 19, 1975



A FEW DOLLARS RICHER — Suggestors and Tech Brief authors cashed in on their brainstorming at an award ceremony November 25. Seated, left to right, are Georgia J. Everette, Sharon L. Hardy, Mary E. Duoto, G. D. Badhwar and William A. Wohnhaas. Middle row: Richard B. Benson, Lubert J. Leger, William S. Schneider, Robert G. Richmond, LeRoy G. Fehrenkamp, James T. Heffernan, William S. Lee and Rees H. Underhill. Back row: Jack A. Kinzler, Charles L. Bailey, Jr., H. Wayne Boswell, Walter M. Surrency, William E. Perry, Norman H. Gabbard and Charles A. Moore. Inset: Arthur V. Torres, JSC-Downey.

Suggestors, Tech Brief Authors Receive JSC Cash Awards

A total \$1110 in JSC Suggestion Award money went to 11 employees and 12 received \$50 Tech Briefs under the NASA Technology Utilization program November 25 ceremonies.

Suggestion awards of \$50 went to Robert G. Richmond, SETD, for a method of cable checkout in large vacuum chambers; and to William A. Wohnhaas, TSD, for a method of fabricating Shuttle mockup stringers.

Receiving \$35 suggestion awards were Richard B. Benson, CTPD, for suggesting changes to parking lot striping near Bldg 45 to allow mud-free pedestrian routes; Rees H. Underhill, TSD, for a vacuum furnace exhaust; Mary E. Duoto, LD, for suggesting a pedestrian

Faget Gets ASME Medal

Maxime A. Faget, JSC Director of Engineering and Development December 3 received the American Society of Mechanical Engineers Gold Medal. Faget received the medal at the ASME annual winter meeting honors assembly in the Hyatt Regency Hotel in Houston.

The Gold Medal was established by ASME in 1920 as an award for "eminently distinguished engineering achievement."

Previous JSC recipients of the ASME Gold Medal are JSC Director Christopher C. Kraft, Jr., 1973, and former JSC Director Robert R. Gilruth, 1970.

Faget has been JSC Director of Engineering and Development since November 1961, and was responsible for design, development and environmental testing of the Mercury, Gemini and Apollo spacecraft, and the Space Shuttle.

He joined the National Advisory Committee for Aeronautics (NASA predecessor) in 1946 as a research scientist.

walkway at Bldg 419; Charles A. Moore, TSD, for disc sander safety modifications; Robert H. Cartmill, ERL, for clarification of dictionary definition entries; and to H. Wayne Boswell, Personnel Office, for a method of verifying proper charges in college tuition invoices.

Sharon L. Hardy, SD, and Georgia J. Everette, EAD, each for \$25 for independently suggesting ways of reducing visitor bus blockage of crosswalks.

Top suggestion money went to Arthur V. Torres of QAR&SO-Downey who received \$750 for a suggestion estimated to save more than \$100,000 a year in Shuttle paperwork.

Tech Brief \$50 award recipients were: Charles L. Bailey, CSDD, for solid-state controller; Lubert J. Leger, SMD, for surface insulation crack detection method; Norman H. Gabbard and Walter M. Surrency, both of TSD, for an automatic photofilm marker; G.D. Badhwar, PESD, and LeRoy G. Fehrenkamp, TSD, for an inexpen-

sive lightweight mirror of optical quality; William E. Perry, TCDD, for field-sequential stereo television; William C. Schneider, SMD, for a method of attaching insulation which eliminates compatibility bondline stresses; and Jack A. Kinzler, LeRoy G. Fehrenkamp, James T. Heffernan and William S. Lee, all of TSD, for a method of bonding plastic film to aircraft wing surfaces to achieve low-drag smoothness.

Industry Gets RFPs to Study Shuttle-Launched Space Station

The aerospace industry is being asked by NASA to study how the Space Shuttle, this nation's next generation of spacecraft may be utilized to transport a space station into orbit.

NASA has issued a request for proposals from industry on a "Space Station Systems Analysis



BROOKS IN CAMEL LOT — JSC's Mel Brooks and a dromedary friend did the tourist bit at the Great Pyramid of Cheops in Gizeh, a suburb of Cairo, as the Brooks family vacationed in October after his new assignment as JSC representative at the European Space Agency's Research and Technology Centre, Noordwijk, The Netherlands. Brooks is the one wearing the kaffiyeh.

We have come to the end of another successful year at the Johnson Space Center, a year of which we can each be very proud.

A good part of this year was occupied with the joint planning and conduct of the very successful Apollo Soyuz Test Project with the Soviet Union, with the manufacture and initial assembly of the Shuttle Orbiter 101 vehicle, and with the

continuing challenges of the various Earth Resources and other scientific programs that we are conducting. The performance of these very difficult tasks was outstanding and brought credit to the Center and to NASA.

In the coming year we face equally demanding tasks as the Shuttle vehicle is assembled, the rigorous testing to support the approach and landing tests begins, and we continue our support of other programs here at the Center.

Slayton Named ALT Deputy

Donald K. Deke Slayton Tuesday was named JSC Deputy Director of Flight Operations for Approach and Landing Test. In his new assignment Slayton will report to Director of Flight Operations Kenneth S. Kleinknecht and will be responsible for planning and carrying out the Space Shuttle Orbiter approach-and-landing tests (ALT) at NASA Flight Research Center.

Slayton was docking module pilot in last July's Apollo-Soyuz joint mission with the Soviet Union. He was selected in April 1959 as one of the original Mercury astronauts. Other JSC assignments have been Director of Flight Crew Operations from November 1963 until being named to the ASTP crew in February 1974, and coordinator of astronaut activities from September 1962 until November 1963.

Slayton holds a BS in aeronautical engineering from the University of Minnesota.

As NASA enters its 18th year, we continue to face new challenges. I look to your continued support and dedication to every task, no matter how small.

I would like to wish each of you and your loved ones a most happy Christmas season and all the best in the New Year.

Christopher C. Kraft, Jr.
Director

Ford Signs December 26 Day-Off Order

President Gerald Ford Monday signed an executive order which gives most federal employees the day off December 26. Except for certain State and Defense Department and other agency facilities which will remain open "for reasons of national security or defense or other public reasons," most federal employees will have a four-day Christmas holiday.

Study." Proposals are due by January 26, 1976.

NASA plans to issue two \$700,000 contracts in April for parallel 18-month conceptual studies, one managed by JSC and the other by the Marshall Space Flight Center, Huntsville, Ala.

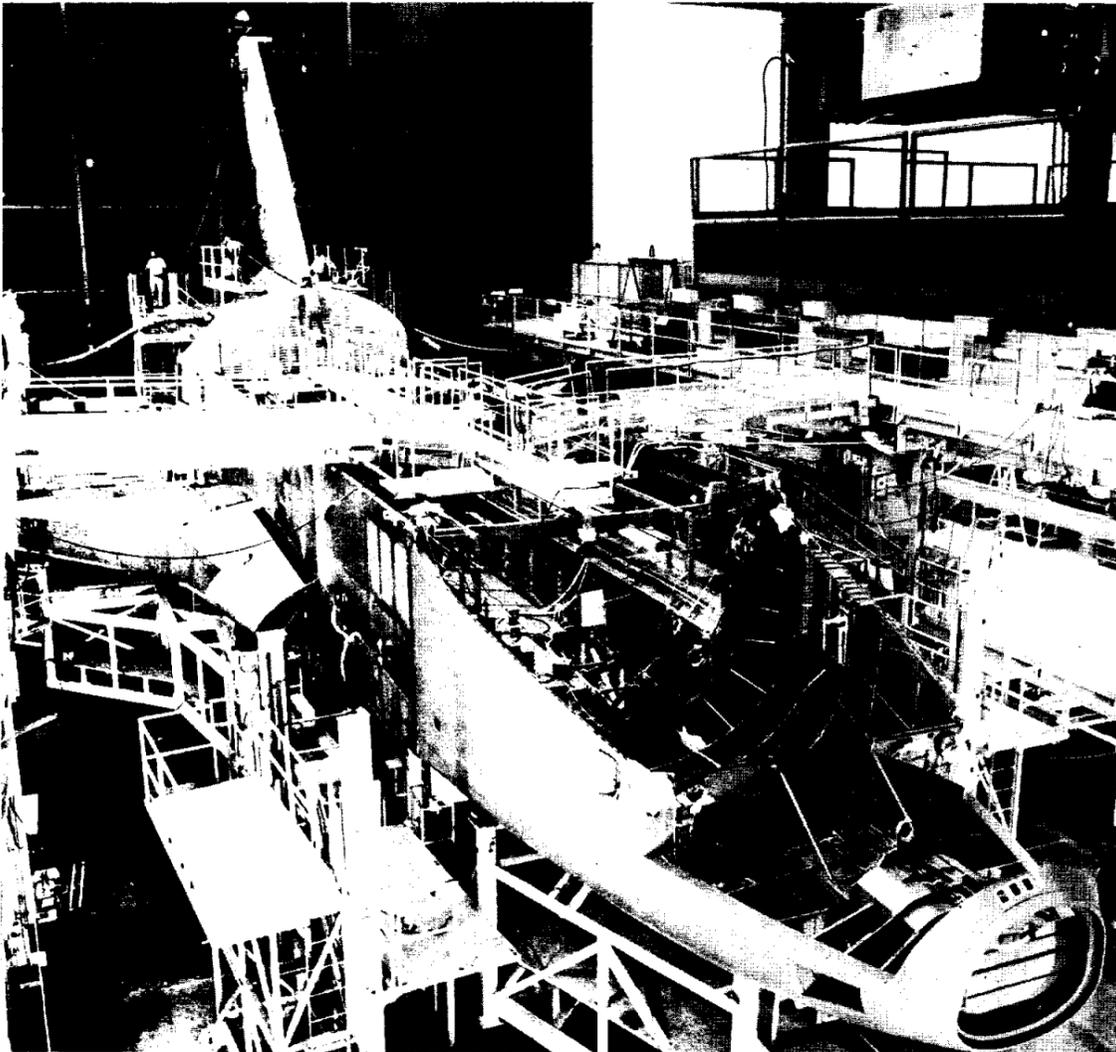
Contractors will study low and synchronous orbit Space Station facilities of modular construction to begin in the mid-80's. Major emphasis will be placed on assuring inherent growth potential for the Space Station over a period of years. Unless advantages can be achieved by using a shuttle-derived heavy lift vehicle, the delivery, assembly, and support for the Space Station will initially be provided by the NASA reusable space transportation system. This requires that elements of the station be compatible with the Shuttle Orbiter cargo bay, which is 18.3 meters (60 feet) long and 4.6 meters (15 feet) in diameter.

The Space Station will be responsive to a wide range of "Operational Base" and "Space Laboratory" activities. Typical "Operational Base" activities include the use of a Space Station as a test facility and construction base to

support the manufacturing, fabrication, and assembly of various sized space structures. One example of the use of large structures would be the generation of electrical power through larger solar collectors or reflectors and its transmission to Earth by microwave antennas. Other applications of the Space Station as an "Operational Base" include the retrieval and repair of automated spacecraft and the provision of orbital propellant depot storage and transfer functions needed to refuel orbital transfer systems (Space Tugs) carrying payloads from low to high Earth orbit or an escape orbit.

Functioning as a "Space Laboratory," the Space Station would accommodate materials processing and commercial manufacturing, basic and applied physical sciences experiments, space physics and astronomy missions; life sciences research; and provide for the continued development of sensor technology in such areas as Earth surveys, navigation, weather and climate research.

Weight limitations for modules is 29,484 kilograms (65,000 pounds) for launch and 14,515 kilograms (32,000 pounds) for landing.



INCHING ALONG TO ROLLOUT — Space Shuttle Orbiter 101 is surrounded by workstands and catwalks as final assembly moves ahead at Rockwell International's Palmdale, California assembly plant. At the time this photo was taken, the wings, vertical tail and lower forward fuselage had been mated to the mid/aft fuselage. Major components still to be mated to Orbiter 101 are the crew compartment, upper forward fuselage and landing gear. Orbiter 101 rollout is expected in September 1976 — nine months away.

U of New Mexico Offers Heat Pipe Short Course

The eighth annual Heat Pipe Technology Short Course will be held Jan. 5-9, 1976, at the University of New Mexico, Albuquerque.

The five-day session, intended for engineers, scientists and technical persons working with heat transfer and energy systems, will cover the basic concepts of heat pipe theory, design and fabrication techniques needed to apply the heat pipe to practical uses.

Heat pipe technology is becoming increasingly important as the

world energy crisis becomes more severe.

The course is being sponsored by the University's College of Engineering and the Technology Applications Center. The Center is one of six Industrial Application Centers operated by NASA and various academic and research organizations throughout the country. These centers play a key role in the transfer of space developed technology for non-aerospace uses.

The heat pipe is a simple, high performance heat transfer device that can transport heat over long distances and at high rates with little temperature drop. It is more effective than the best solid heat conductors and has many practical applications. Heat pipes are being used in construction of portions of the Alaskan pipeline.

Course coordinator is Dr. K. Thomas Feldman, Jr., professor of mechanical engineering at the university and a nationally known heat pipe expert.

Registration fee for the course is \$330. This includes textbooks, computer programs, extensive notes and a bibliography of heat pipe patents and technical articles. Commercial heat pipe devices will be demonstrated during the course.

Persons wishing to attend the course should contact the Technology Applications Center, University of New Mexico, Albuquerque, N.M. 87131. Applicants are urged to register early.

SEE YOU NEXT YEAR



Roundup Skips January 2 Issue

Roundup will not be published on January 2, the next normal bi-monthly publication date, because of the Christmas-New Year holidays. Publication will resume January 16.

Roundup issue dates for 1976 are as follows: Jan. 16, 30; Feb. 13, 27; Mar. 12, 26; April 9, 23; May 14, 28; June 11, 25; July 9, 23; Aug. 13, 27; Sept. 10, 24; Oct. 8, 22; Nov. 12, 26; and Dec. 10, 23.

Satellite Photos to Aid in Predicting Snow-Melt Runoff Volume in West

NASA, along with nine other Federal and state agencies, is working to analyze the usefulness of data gathered by space satellites for predicting the amount of water to be expected from melting snow in mountain areas of western United States.

Accurate predictions of snow-melt are important in planning the

best use of water for power generation and irrigation and for flood-control planning and estimating future water supplies for major cities.

Federal agencies in the program, besides NASA, are the National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey, U.S. Bureau of Reclama-

tion, U.S. Army Corps of Engineers, U.S. Soil Conservation Service and Bonneville Power Administration. State agencies are the Arizona Salt River Project, California Department of Water Resources and Colorado Division of Water Resources.

Overall coordination of the project is the responsibility of NASA's Goddard Space Flight Center, Greenbelt, Md.

Through the end of this month, Goddard will work with other agencies to analyze data returned from NASA's two Earth-orbiting LANDSAT spacecraft and NOAA weather satellites showing snow cover in mountain areas of four regions in California, Colorado, Oregon and Arizona. This will provide a data base and develop expertise on how to use satellite observations in an operational snowmelt-forecasting system.

Then, beginning next spring, NASA and NOAA will provide data — primarily pictures — to water resources managers in the four regions on a near real-time basis.

At the end of the study project in 1978, the user agencies will evaluate the usefulness of the satellite data in improving the accuracy and reducing the cost of predicting stream flow from melting snow in western watersheds fed by high mountain ranges.

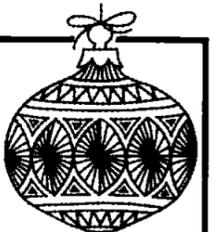
Up to now, such predictions — useful in deciding whether to hold or release water in reservoirs — have been based on observations from aircraft and limited measurements by observers penetrating remote wilderness areas on foot or land vehicles.



"...boxing gloves, a baseball glove, a firewoman's hat, a doctor's kit..."

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Editor: Terry White

Photographer: A. "Pat" Patnesky

SANTA WILL REMEMBER...
CAUSE YOU'VE BEEN GOOD, THANKS...

Merry Christmas

AND A VERY
Happy New Year

B. H. Four

BH4 - YOUR FRIENDLY COST REDUCTION OFFICE
NASA Form 1105A (Cost Reduction Report)



Satellite Scans Ozone

Earth's protective ozone layer above the equator came under the eye of NASA's newest Atmosphere Explorer (AE) satellite early in December.

An ozone detector aboard the spacecraft, called a backscatter ultraviolet (BUV) spectrometer, will provide information on the ozone layer in the equatorial region of the globe between 20 degrees North and South.

Immediately after the instrument was activated on December 4, controllers at NASA's Goddard Space Flight Center in Greenbelt, Md., began receiving data on a checkout basis. The BUV spectrometer became fully operational the following week.

Six other instruments aboard the satellite, which was launched Nov. 19, already had been turned on, and five more were activated.

The ozone detector was added to the satellite last spring by NASA as part of the agency's program to measure the atmospheric distribution of ozone on a global scale. The equatorial region is presumably one of the most active regions of ozone production in the atmosphere.

The ozone layer in the stratosphere is a planetary cover which shields Earth from most of the dangerous ultraviolet radiation from the Sun.

Concern has been expressed that manmade pollutants are building up in the atmosphere at such a rapid rate that they will begin depleting the ozone layer before the end of the decade.

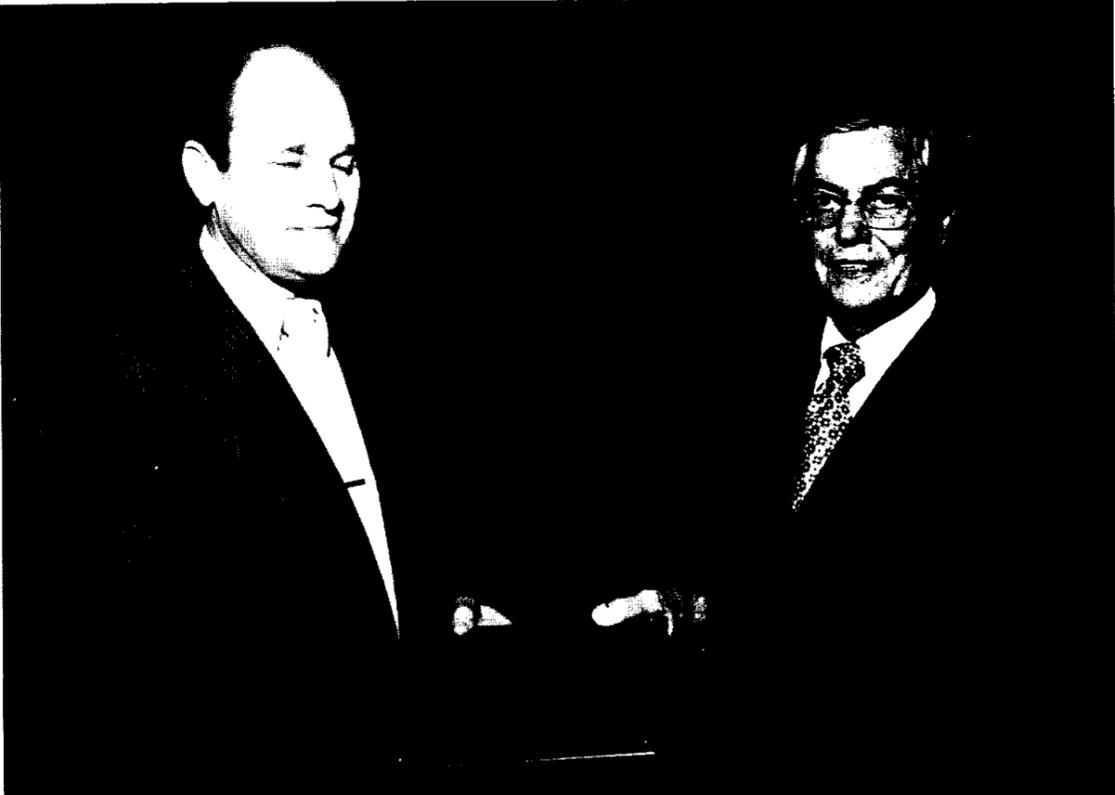
Scientists fear that a serious reduction in the ozone cover and subsequent increase in the amount of ultraviolet light striking Earth could lead to an increase in the incidence of skin cancer, as well as changes in the average temperature of Earth's atmosphere.

Information returned from the BUV spectrometer in conjunction with the other experiments may well represent a major step in understanding the interaction of upper atmosphere constituents with solar ultraviolet light and the resulting impact on the ozone layer.

In addition to ozone information, instrumentation aboard the Atmosphere Explorer is designed to return information on Earth's heat balance and energy conversion mechanisms and the flow of heat or energy from one hemisphere to another.

The AE satellite, designated Explorer 55, was launched aboard a Delta rocket from Cape Canaveral, Fla., into near-perfect orbit of 3,000 kilometers (1,860 miles) by 157 km (97 mi.). It is the third in a series of maneuverable unmanned scientific spacecraft.

Goddard has management responsibility for Explorer 55 and the Delta. RCA Corp., Princeton, N.J., is prime contractor for the spacecraft and McDonnell Douglas Corp., Huntington Beach, Calif., builds the Delta.



RECEIVES FBA AWARD — JSC Experiment Systems Division chief Dean F. Grimm, left, receives the Federal Business Association Outstanding Civil Servant Award from Houston FBA Chapter President Addison A. Hunter, Jr. at Ellington AFB Officers' Club ceremonies December 6. Grimm was nominated for the award for his "continuing contributions to the success of the space program and for his dedication to the youth of the community."

NASA Forms Aviation Safety Group

NASA has established a new advisory subcommittee to review the objectives, approach, content and structure of the NASA Aviation Safety Reporting System in support of the Federal Aviation Administration Safety Reporting Program.

The subcommittee on aviation safety reporting has been established under the Research and Technology Advisory Council (RTAC) Panel on Aeronautical Operating Systems.

A recent NASA/FAA agreement calls for NASA to act as a "third party" for the purpose of receiving, processing and analyzing reports of unsafe conditions or practices, filed

under the FAA program.

The objective of the FAA program is to provide the safest possible aviation systems by identifying and correcting unsafe conditions before they lead to accidents. Utilizing NASA in the third party role should further stimulate the free and unrestricted flow of information, providing for protection of the identity of persons involved in reports submitted to NASA, except in these cases of alleged criminal conduct or actual accidents.

The new RTAC subcommittee will review and evaluate critical elements of the NASA Aviation Safety Reporting System before initial operation and the progress of the operational system after implementation in April 1976. The subcommittee will also advise NASA with respect to the maintenance of anonymity of persons submitting safety reports or persons named therein.

The advisory subcommittee in-

cludes aviation and consumer associates as well as those involved in the operational aspects of the national aviation system.

Chairman of the NASA advisory subcommittee is John H. Winant, of National Business Aircraft Association.

Other members include: Ralph F. Nelson, Aircraft Owners and Pilots Association; F. L. Wallace, Pan American World Airways; William Blair, United Airlines; Lloyd E. Frisbee, Lockheed Aircraft Corp.; R. J. Masiello, American Airlines; G. F. Quinby, NARCO Avionics; Larry Youngren and Robert Holt, FAA; Thomas S. Falatko, DOD; Frank Munley, Aviation Consumers Action Project; and Charles E. Billings, (Ex-Officio), NASA's Ames Research Center.

Executive secretary for the group is E. Gene Lyman, NASA Headquarters, Office of Aeronautics and Space Technology.



Roundup Swap-Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

BOATS

Newport-built Finn No. 297, 2 masts, booms, sails, from valuable mold, won numerous local/district races, spec galv trailer. Goodman, 333-2778.

VEHICLES

71 Honda CL-70 street bike, \$175. White, 554-2916.
20-in girl's bike, \$6. Nanette, 534-4946 Dickinson.

71 Chevy Malibu, good cond, wife's car, radio, htr, air, auto, \$2000 or best offer. Matthews, 495-5575.

72 Cutlass 2-dr Supreme, hrtdp, low miles, xint cond, \$2350; 69 Chevy Nova, manual, low miles, 2-dr, \$600. 332-4732 or 641-2904.

70 Holiday 24-ft travel trailer, slps 6 ent self cont, \$2500. 488-1366.

71 Harley Davidson gas golfcart, 2 new tops-1 w/surrey fringe, new paint, carpet, spare tire, xint cond, being xferred. 488-1444 after 5.

74 Kawasaki 90MX1 minibike, xint care/cond, delight for any youngster to own. 944-6513.

74 Husqvarna 360RT It wt street/trail, forgives novice, strong enough for pro, xint cond. Canniff, 944-6513.

71 Honda SL125, low miles, good cond, \$225. Doherty, 488-0182.

69 Chrysler Newport, auto, all pwr, radio, new tires orig owner, \$600. 471-0089.

69 Chevy Impala Custom Coupe, air, pwr, auto, good tires, good cond, \$750. Stull, 334-3370.

71 Ford 1/2-ton sports custom pickup, LWB, xint cond, std shift, gages, radio, air, new steel belts. Guerrero, 864-0459 after 4.

73 Ford F-100 LWB, air, pwr, tow pkg, glass camper cover, \$3200. 488-0186.

Schwinn 20-in girl's Hollywood bike, coaster brks, good cond, cost \$61.95--sell \$28. 645-1001.

PROPERTY AND RENTALS

4-2 1/2-2 colonial in El Lago, 2750 sq ft, oak-wooded acre, brick patio, walk dist to school, community pool, tennis, lake, by owner. 334-3001.

2-acre lot in El Dorado subdiv Friendswood, \$7500. Zupp, 482-7156.

5-acre tract Alvin area 3 mi east Hwy 6, fenced, \$1050/acre cash. 482-3989 after 6.

2 acres hvly wooded, 2 sprng-fed lakes, Stagecoach Farms NW Tomball, \$5500/acre. Arnim, 333-4362.

HOUSEHOLD ARTICLES

GE 220v elec clothes dryer, cprrtn, good wrkng cond, \$50. Arnim, 333-4362.

Green-gold-white cut velvet early American chair, like new, \$50; two Sealy Posturepedic twin beds w/frames, mattresses; mahogany early American highboy, xint cond. Goodman, 333-2778.

Solid maple twin-size spindle bed frame, \$35. 488-1366.

Harman Kardon AM/FM stereo w/Garrard chngr, 20rms watts/chan, new Pickering dmd stylus, \$50 w/o spkrs, would consider sell w/spkrs. Glines, 861-5278.

Child's rknng hobbyhorse, xint cond, \$13.50; open cartop carrier, used once, \$7.50. McCray, 332-4081.

Clairel makeup mirror \$15, Sunbeam curlstick \$7; frosted wig w/stand, case \$20; Lady Sunbeam manicurist \$10. Sherron, 483-6278.

Spanish table w/4 chairs, good cond, \$40. Carol, 471-4235.

5-pc pecan Mediterranean dining set: (58-in oval table, 4 chairs w/uphol seats, \$195--orig \$249. 946-6242 after 5.

Hammond K-111 series 9385 organ, \$600. McPhillips, 333-3792 or 333-4659.

MISCELLANEOUS

Caravelle student trombone w/Bach mthpc, case, \$125. Arnim, 333-4362.

6-day Windjammer cruise ticket for two: choice of Bahamas, British Virgin Islands, or West Indies, \$590 value for \$500, literature on areas/trip. Goodman, 333-2778.

Gibson Epiphone jumbo guitar, mahogany back/sides, sunburst, stnls steel keys, xint cond, \$180. 472-4456 after 5:30.

5 H78-15 tires, 8000 mi, xint cond, \$80. 774-3587 after 6:15.

All sizes guppy tanks, equip, fish etc at bargain prices 554-2126.

72 Stenotype machine w/Z key, case, stand, books, like new, \$100. Scogin, 479-3751.

Halticrafters HT-37 ham xmitr, very clean, \$150. Lindsey, 488-0517.

Wilson T-3000 tennis racquet, almost new, 4 1/2-in grip, med wt, \$20. 474-4808.

WANTED

Backpack frame/pack, nylon-string guitar. 488-2652.

CARD OF THANKS

A special "Thank you" to all who contributed blood recently to the Blood Bank in my husband's name.

--Mrs. Joe Dodson.

EAA ATTRACTIONS

HOUSTON LIVESTOCK SHOW AND RODEO

The EAA has a block of 200 tickets for each of four Houston Livestock Show and Rodeo in late February and early March. Performances and star attractions are: Feb. 27 evening, Freddy Fender and Tanya Tucker; Feb. 29 matinee, Olivia Newton-John; Mar. 2 evening, Charlie Pride; Mar. 7 evening, Mac Davis. Tickets are front mezzanine (orange seats) at \$5.50 each, and go on sale Monday Dec. 22 in Bldg 11 Exchange Store.

TICKETS AVAILABLE

On sale in Bldg 11 Exchange Store 10 am to 2 pm, no refunds: Houston Ballet *Nutcracker*, Jones Hall 8 pm Dec. 21, 22, 13, EAA price \$4 and \$3, regular \$6 and \$5. Free: Disney Magic Kingdom cards, Six Flags over Texas Funseekers cards, Lion Country Safari cards.

Dinner theaters: Windmill Dinner Theater, Pat Paulsen in *Last of*

the Red Hot Lovers, \$14/couple thru Jan. 2, valid only Tue-Wed-Thur, make reservations now, Dean Goss Dinner Theater, John Bouess comedy *The Loud Red Patrick*, \$16/couple, not valid Sat.

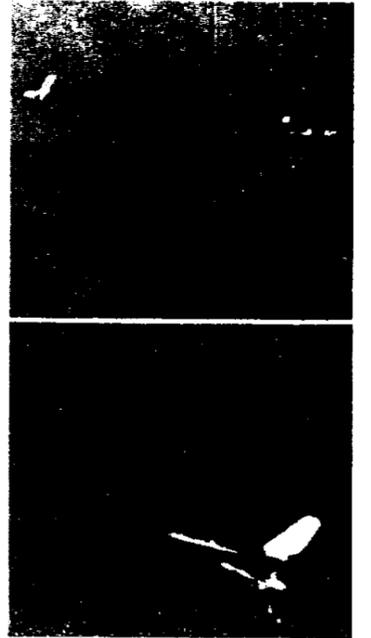
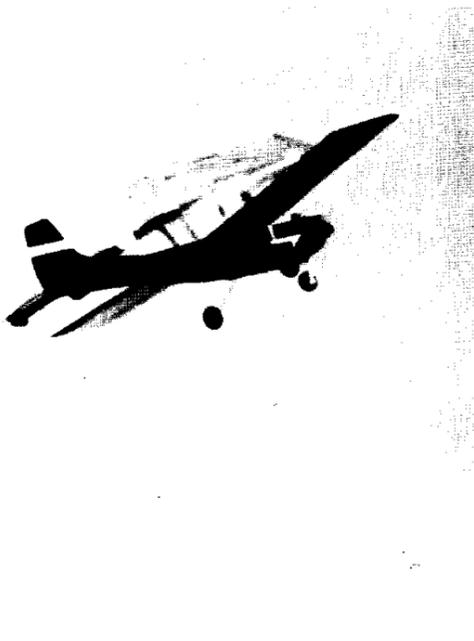
Sea Arama adults \$3.25, children \$2.25. JSC Children's Christmas Party tickets \$1.50, December 20 (tomorrow!), no door tickets sold.

DEFENSIVE DRIVING

Don't forget Defensive Driving Course registration January 6 and 7, with classes the following two weeks. Learn how to defend yourself against the drivers who don't take the course.

NOTICE

A handwritten announcement has appeared on JSC bulletin boards advertising membership in a health club and implying EAA approval. EAA knows nothing about the club and in no way recommends for or against membership.



KIKER'S MINI-ORBITER UPSTAGES ALT FLIGHTS — A 1/40th-scale Space Shuttle Orbiter, built originally for flotation tests, is prepared for a mini-ALT mission on the Bldg 14 Antenna

Test Range. At left Art Arro and Owen Morris make final preflight adjustments to the carrier aircraft and Orbiter while John Kiker tweaks control surfaces with the radio control console. Following

takeoff and a low-level flyby, the surrogate 747 climbs to drop altitude for radio-command Orbiter release. Orbiter is steered in to a landing by radio signals driving elevon actuators, bottom right.

Orbiter Makes ALT Flights At JSC (1/40th Scale, That Is)

A JSC engineer's leisure-time hobby may provide some indication of Space Shuttle Orbiter flight characteristics before the Orbiter is air-dropped to land in the California desert sometime in 1977.

John Kiker of the JSC Spacecraft Design Division modified a 1/40th scale Orbiter model that had been used in earlier flotation tests. Formed from plastic foam sprayed into a reverse mold, the model is ballasted to simulate the approximate scale mass and center of gravity of the actual Orbiter.

Kiker launches the Orbiter model from atop a gas-powered radio control model airplane. A radio signal separates the Orbiter from the carrier aircraft at the desired altitude, and a second radio transmitter allows the Orbiter to be flown to its dead-stick approach and landing on the Bldg 14 Antenna Test Range.

The full-size manned Orbiter will be dropped from atop a modified Boeing 747 jet transport sometime in 1977 at NASA Flight Research Center, Edwards, California to glide down to landings as a prelude to first orbital flight in 1979. Orbiter will make its final approach at a glideslope of 21 to 24 degrees, followed by flareout and touch-

down at 185 knots.

The bright-red Orbiter model has a radio control receiver that drives servos to move elevons for pitch control and differentially for roll control. A conventional rudder, with split speed brakes, are on the full-size Orbiter now in final assembly at Rockwell International's plant at Palmdale, California. Roll-out of the first Orbiter is now scheduled for September 1976, with approach-and-landing tests (ALT) the following year.

Orbiter flight crews will train for the ALT flights in Grumman Gulfstream II jet aircraft which have been modified with drag devices to simulate Orbiter's high sink rate and landing speed.

Kiker made his first model test flight to check out the pylon release system, gradually working up to his "mini-ALT" flights. He uses his personal radio control equipment, and made Orbiter model modifications in his home shop.

"I believe radio control scale models are a good means of provid-

ing an initial indication of Orbiter control characteristics and separation dynamics before you start flying the real thing with live pilots," said Kiker.

Kiker's surrogate 747 is a Sterling Models "Gazariator" powered by a Fox Hawk-60 engine.

JSC Radio Control Club members Owen Morris, Tim Brown, Don White, Art Arro, Gil Symons and Jay Smith have encouraged and assisted Kiker in the Mini-Orbiter project.

Kiker has been building and flying model aircraft since he stopped piloting full-size airplanes in 1963, and is internationally known for his radio control model activity.



Take stock in America.
Buy U.S. Savings Bonds.



GENO AND FRIEND — Apollo 17 commander Eugene Cernan shows Cystic Fibrosis Foundation national poster child Allison Brannon the kind of clothes he wore on the moon. Allison visited JSC's Exhibit Hall December 8.

Pioneer 6 Keeps on Truckin' Past Interplanetary Decade

NASA's Pioneer 6 interplanetary spacecraft Tuesday had been circling the Sun and returning good data for ten years. This is believed to be the longest operating life ever attained by an interplanetary spacecraft.

Officials are delighted with this performance because Pioneer 6 design specifications called for a required life of at least six months.

Pioneer 6 made the first detailed measurements of the interplanetary medium, some spanning a half billion miles. The workhorse spacecraft has measured the Sun's corona, returned data on solar storms from the inaccessible, invisible side of the Sun, and measured a comet's tail. It has made discoveries about the Sun itself, the solar wind, solar cosmic rays, and the solar magnetic field, all three of which extend far beyond the orbit of Jupiter.

Pioneer 6 and its three sister spacecraft, Pioneers 7, 8, and 9, also years beyond their six-month design lives, make up a network of solar weather stations which circle the Sun, usually in locations millions of miles apart. All of the current Pioneers (Pioneers 6 through 11) are still operating, and were designed as rugged, relatively-simple, low-cost spacecraft.

Pioneer 6 was built by TRW systems, and the Pioneers are managed by NASA's Ames Research Center, Mountain View, CA. Five of the six scientific instruments, and all other systems aboard Pioneer 6 continue to work well.

Accounting Seminar, Russian Refresher Start in January

Dr. James J. Finley, professor of administration at California State College, will hold a seminar for government accountants next month sponsored by JSC and the Houston Chapter of the Association of Government Accountants. Call Gene Horton at 3734 for registration information.

The JSC Employee Development Office has scheduled the Foundations of Russian II UofH course for Mon-Thurs 4-5:30 pm starting January 19. Employees desiring to register for this course should call Stan Goldstein or Wanda Thrower at 3734 for UofH-CLC registration forms and other information.



SPACEFLIGHT HOPEFULS — Three would-be Spacelab crewpersons prepare to submerge in Marshall Space Flight Center's neutral buoyancy facility to work out zero-g Spacelab experiment handling procedures. Left to right are materials engineers Dr. Mary Johnston and Carolyn Griner, and physicist Ann Whitaker. The three hope to be among the first American women to fly in space.